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ABSTRACT

The long-term effectiveness of the North Carolina Basic Education Summer School Program (BEP) was examined. North Carolina has instituted a testing and summer remediation program for academically at-risk students at grades 3, 6, and 8. The BEP sample was obtained by a stratified random sampling of schools in North Carolina. Results were categorized according to sample attrition, representatives and equivalency of study groups, summer school attendance, and inferential statistics. Research evidence suggests that summer losses in achievement for lower socioeconomic status children deepens the gap between these students and their higher socioeconomic status peers. For compensatory education students, gains made in remediation programs during the regular school year seem not to be sustained over the summer months and into the next year. Appended are four references. (SI)

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North Carolina's Summer School Program for High-Risk Students: A Two-Year Follow-up of Student Achievement

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North Carolina's Summer School Program for High-Risk Students:
A Two-Year Follow-up on Student Achievement

North Carolina has instituted a testing and summer remediation program for academically at-risk students at grades 3, 6, and 8. Research evidence seems to suggest that summer losses in achievement for lower socioeconomic status children deepens the gap between these students and their higher socioeconomic status peers (Heyns, 1978). For compensatory education students, gains made in remediation programs during the regular school year seem to not be sustained over the summer months and into the next year (e.g. David and Pelavin, 1978; Pelavin and David, 1977). This paper looks at the long-term effectiveness of the North Carolina Basic Education Summer School Program.

Background

The North Carolina *Basic Education Program (BEP)*, a major piece of legislation designed to impact public education in a variety of ways, was approved by the NC Board of Education in 1984. A number of performance standards were initiated, including a minimum skills testing program at grades 3, 6, and 8. State promotion standards were put in place to provide "gateways" of achievement for third-, sixth-, and eighth-grade students. During the first phase of the testing program, students who score at or above the 25th national percentile on the *California Achievement Tests (CAT)* meet the state promotion standards. Students who have already been retained within their current grade span (K-3, 4-6, or 7-8), or who are classified as Mentally Handicapped, are excluded from the state promotion standards.

The second phase of the testing program is the NC-developed *Minimum Skills Diagnostic Tests (MSDT)* at grades 3, 6, and 8. These approximately 100-item tests in Reading, Language and Mathematics, administered during three consecutive mornings, test the minimum competencies judged to be essential for success at the next grade level. The scoring of the tests is performed locally, and provides an individual diagnostic profile for each student.

During 1986, the criterion level for mastery was set at 65% correct . The cut-off was raised to 70% correct for 1987 and subsequent years. Students who do not meet the mastery level are required to go to the BEP Summer School or are retained in grade. Students who do not meet

more stringent local promotion standards at the third, sixth and eighth grades, and who are invited to attend the BEP Summer School, are also tested with the *MSDT*. During 1986 the BEP Summer School was offered only for students in grades 3, 6, and 8. In 1987 the program was expanded to serve grades 1-4, 6, and 8 (although state standards still only applied to grades 3, 6, and 8). The program was further expanded in 1988 to include grades 1 through 12.

The Summer School is different from the regular school year in a variety of ways. Perhaps most importantly, the teacher:student ratio is at or below 1:15, providing for more individualized instruction. The *MSDT* diagnostic profile sheet provides third, sixth and eighth grade Summer School teachers with a great deal of guidance as to the specific instructional needs of the students, with respect to the minimum skills specified in the *BEP*. Staff development for Summer School teachers, provided before the start of the program, emphasizes the development of students' positive self-concepts as learners. Additionally, basal texts are not allowed during Summer School, and alternative "hands on" methods and materials are provided. In general, the Summer School Program lasted for about four weeks.

A shorter (100-item) version of the *MSDT* is administered at the end of the summer program. This test is primarily intended for use in evaluating the summer program, so that there is no state criterion level for promotion. Promotion decisions on individual students are made locally using traditional factors such as teacher judgment.

The BEP Summer School Program has enjoyed a great deal of success, as evidenced by strong *MSDT* gains. Teacher, administrator and parent judgments were surveyed in 1986, and the results were very favorable toward the Summer School. For example, the overwhelming majority of administrators and teachers (approximately 98%) felt that the program was beneficial to students. Ninety-five percent of parents said that if they had it to do over again, they would send their children to Summer School again. Parents reported that their children benefitted most by improvement in the basic skills areas of Reading, Language Arts, and Mathematics.

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Despite the apparent success of the program, a great deal of interest has centered on whether or not the academic gains that students made in Summer School were sustained. That is, did these students, who were at risk of academic failure, perform better in subsequent school years? Were they be less likely to be retained in grade in the future? This report presents preliminary findings of a two-year follow-up study of the 1986 BEP Summer School Program's third and sixth-grade graduates.

Method

Sample

Since all eligible students were invited to attend the BEP Summer School, random selection and assignment was not possible. Instead, the comparison population was the 1985 cohort that went through the third or sixth grade the year before the summer school remediation was available. The BEP Summer School sample was obtained by a stratified random sampling of schools in the state. School systems had to meet several criteria to be included in the study. First, because of the nature of the comparison group, any school system that had a remedial summer program for low-achieving students at grade 3 or grade 6 in 1985 was eliminated for sampling purposes. Approximately 10 of NC's 140 school systems had such summer programs. Additionally, because a major outcome variable was standardized achievement test scores, systems which did not test at local option at grades 4, 5, and 7 were eliminated. However, approximately 95% of systems do test at these grades.

The first five randomly ordered schools in each of NC's eight educational regions were selected. Using historical enrollment and promotion data, it was determined that the number of third grade students would be low (the goal was 200 Summer School students in each group per grade), and that few students would have been expected to have been retained subsequent to the summer school. A secondary question of interest was in the relative benefits of promotion as compared to grade retention. Therefore the next two schools were selected to include schools that housed third grade students, and to include systems with retention rates in the upper quartile of the

state distribution of retention rates.

1986 *MSDT* computer files were then used to identify all Summer School students in the selected schools. 1985 *CAT* computer files were then used to find a match for each Summer School student. For each Summer School student, a comparison student in the same school, of the same sex and ethnicity, and with a *CAT* Total Battery scale score within a standard deviation of the Summer School student's score (using the state standard deviation for each particular grade level) was selected. At least one and as many as three potential comparison students were selected for each Summer School student. It was found that one of the selected schools in one of NC's larger school systems was not in operation during 1985-86. Rather than dropping the school from the sample, it was decided to select comparison students from the whole system because of the homogeneous nature of the school system population.

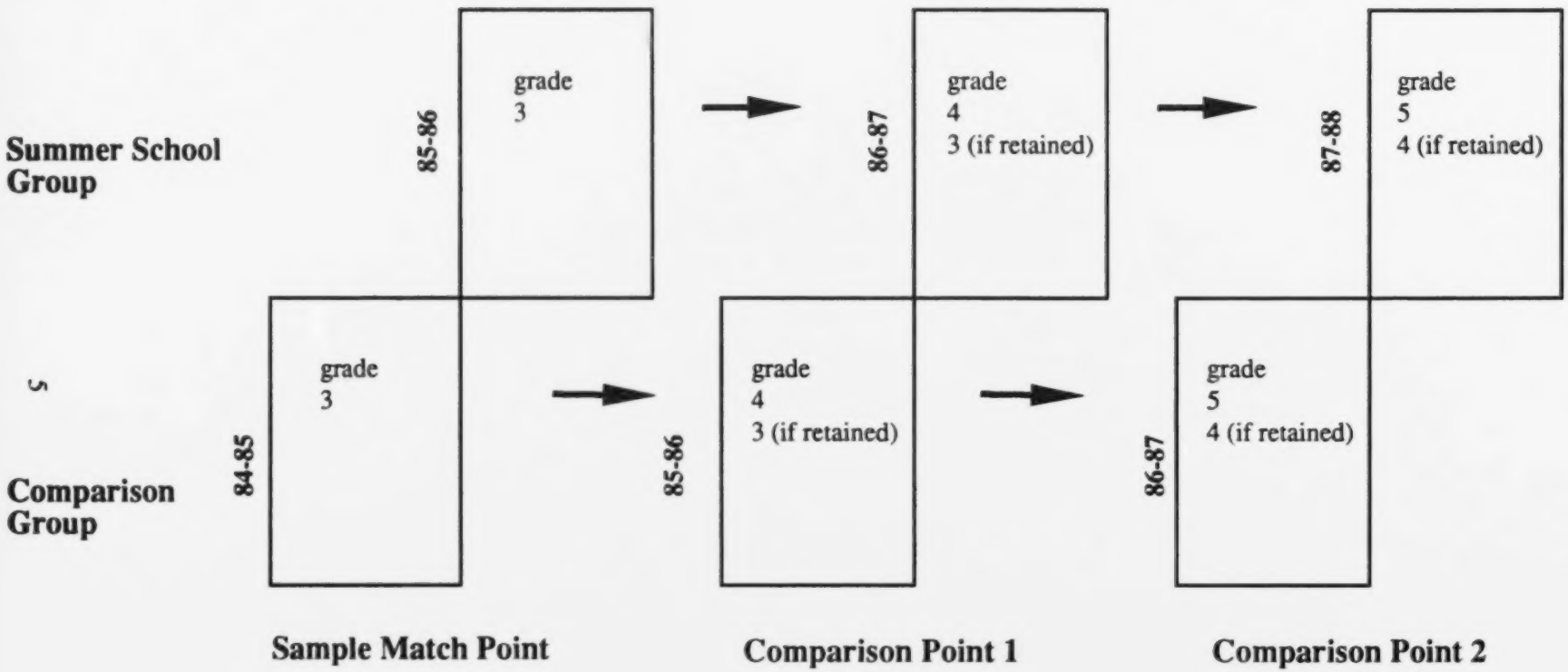
Figure 1 pictures the study design, using the third grade sample for illustrative purposes. The Summer School group is at the top, and for each point the Comparison group (in the same grade as the Summer School group but during the prior year) is shown. The Sample Matching Point was the 1985-86 school year for the Comparison Group, and 1986-87 was the Sample Matching Point for the Summer School group. Comparison Points 1 and 2 are one and two years later for each of the two groups.

Data Collection

Persons were contracted to collect data for either a school system or all systems within an educational region. Testing coordinators at the systems were provided with the names of the students in the Summer School group, and the comparison students in order of preference (the student with the closest *CAT* score was choice number one, and so on). Students were tracked as long as they had not left the school system. Data were collected whenever both the Summer School member of the pair and one of the matched comparison students were located. Data were collected during the spring of the 1987-88 school year from students' cumulative folders to obtain information though 1986-87, and again the following summer to complete data for the 1987-88 school year. The following information was collected: (a) 1986, 1987 and 1988 BEP Summer

Figure 1

BEP Summer School Follow-up
Cohort Design (Grade 3)



School attendance; (b) grade retentions; (c) all available *CAT* Total Battery scores; (d) absenteeism for 1984-85, 1985-86, 1986-87 and 1987-88; (e) teacher grades in Reading, Mathematics and Language Arts for 1984-85, 1985-86, 1986-87 and 1987-88; (f) special education and ECIA Chapter 1 services for 1984-85, 1985-86, and 1986-87.

Variables

Some of the variables were not recorded in a manner conducive to analysis. Therefore, they were converted in the following ways:

> CAT Scores. Prior to the 1985-86 school year, the NC Annual Testing Program used Form C of the CAT. CAT Form E, re-normed in 1985, has been used since 1985-86. At the sample matching point, the Summer School group had CAT E scores and the Comparison group had CAT C scores. Because the scales for the two forms of the tests are quite different, CAT E scores were converted to the CAT C scale for the purpose of matching. The equating of the forms was accomplished by CTB/McGraw-Hill, the test publisher, by administering both forms to geographically representative districts nationwide. The equipercentile method of equating was used, based on distributions of scale scores (CTB/McGraw-Hill, 1986). CAT scale scores are expanded scale scores, designed to show linear increases from one grade to the next;
>
> Teacher grades. Across the school systems in the study, grades were recorded on a variety of scales (e.g., A, B, C, D, F or 100 point scales). Teachers grades in Reading, Language Arts, and Mathematics were converted to a standard four-point scale, with 4.0 being the equivalent of an A, 3.0 being a B, and so on;
>
> Absenteeism. Absenteeism was recorded as part of the NC Annual Testing Program. Number of days absent was recorded as one of four ranges, which were 0-7 days, 8-14 days, 15-21 days, and more than 21 days. The midpoint of each of the ranges, (or a 7 day increment in the case of the last category), was used, so that the possible values were 4, 11, 18, and 25.

Analyses

Descriptive analyses were used for several purposes. One purpose was to evaluate sample attrition; that is, to evaluate whether the students whose records were not located (either because records for the Summer School member of the pair or the Comparison group member of the pair could not be located), were in some way different from the students who were located (the study sample). Another purpose was to evaluate the representativeness of the study group as compared to the statewide Summer School group with respect to sex and ethnicity. Additional variables

which were not used to match the study individuals were used to evaluate the equivalency of the Summer School and Comparison groups on potentially mediating third variables at the time of sample matching.

For the analyses of the differences between the Summer School and Comparison groups, information was retained for all students for whom there were data at the Sample Matching Point (pre-test) and Comparison Point 1, and then for whom there were data at Comparison Points 1 and 2. Additionally, with the exception of the grade retention comparisons, the present report is only on students who were promoted from the third or sixth grade and then from the fourth or seventh grade. Thus at Comparison Point 1 the "third grade group" was in the fourth grade and was in the fifth grade at Comparison Point 2. This was done so as to not compare promoted students with retained students.

Also, by the second comparison point, members of each of the study group may have participated in the1987 summer program. Thus for the current paper the Summer School group was limited to those who were in the summer program only in 1986, and the Comparison group was limited to those who had no summer school experience. The sixth grade Summer School sample had considerably more Specific Learning Disabled students than did the Comparison group. Therefore sixth grade Learning Disabled students were excluded from this preliminary examination of differences between means. The outcome variables of *CAT* Total Battery Scale scores, absenteeism (as a proxy for student attitude toward school), and teacher grades in Mathematics, Language Arts, and Reading, were compared at the pre-test to assess initial comparability, and at the comparison points to compare performance one and two years after the Summer School experience. Additionally, the number of grade retentions for the two years following the Sample Matching Point were compared for the two groups, using Pearson's chi-square statistic.

Results

Descriptive Statistics

Sample Attrition. The total group of students who were identified as 1986 Summer School

students had 280 students in the third grade and 262 in the sixth grade. The samples were from 55 schools in 37 school systems. (Not all of the schools that were selected originally had 1986 Summer School students.) Table 1 provides information on sample attrition one year after the matching. A total of 216 (77.1%) of third grade pairs and 191 (72.9%) of the sixth grade pairs were located. For both grades combined, 75% of the pairs were located. An examination of Table 1 will reveal that in the third grade sample, the students whose records were located had a somewhat higher proportion of blacks and females. The sixth grade students who were located had a somewhat higher proportion of blacks.

CAT scores at the sample matching point for both members of the pairs which were not located are also shown in Table 1. Third grade Comparison students who were not found had CAT scores which were 5 scale score points higher than those who were found, and Summer School students who were located had CAT scores which were 7 scale score points higher than those who were not found. For the sixth grade, CAT scores for Comparison students whose records were not located were 2 scale score points lower than those of students who were found. Summer School students whose records were not located were 7 scale score points lower than those who were located.

The result of any bias due to sample attrition at the third grade would have been to make the group pre-test difference in *CAT* scores that existed even larger, and in the same direction. The result of any bias due to sample attrition at the sixth grade would have been to make the group pre-test differences change from a small difference to a larger difference, in the same direction. With the exception of the third grade Comparison group students, the students whose records were not located were a less able group as measured by the *CAT*. The study group, apparently from less transient families, may have been made up of students who were slightly advantaged as compared to the statewide population. However, 75% of the total sample was recovered, so that the results should generalize for the majority of Summer School students.

Representativeness and equivalency of study groups. Tables 2 and 3 provide data for grades 3 and 6, respectively, on the representativeness of the study sample as compared to the

Table 1
Sample Attrition from 1985-86 to 1987-88

	Grade 3 Demographics				Grade 6 Demographics			
	Found		Not Found		Found		Not Found	
	N	Percent	N	Percent	N	Percent	N	Percent
Females								
American Indian	8	3.7	2	3.0	2	1.2	1	1.1
Black	53	24.8	12	18.2	26	15.1	11	12.2
White	30	14.0	9	13.6	22	12.8	12	13.3
Other	0	0.0	1	1.5	0	0.0	1	1.1
Total	91	42.5	24	36.3	50	29.1	25	27.8
Males								
American Indian	12	5.6	4	6.1	5	2.9	2	2.2
Black	75	35.0	20	30.3	61	35.5	30	33.3
White	36	16.8	17	25.8	56	32.6	32	35.6
Other	0	0.0	1	1.5	0	0.0	0	1.1
Total	123	57.5	42	63.6	135	70.9	65	72.2
Total Number (Pairs)	214		66		172		90	

Grade 3 CAT Total Battery Scale Scores

	Summer School Group		Comparison Group		Difference
	N	Average	N	Average	
Found	214	608	212	620	12
Not Found	55	601	45	625	24

Grade 6 CAT Total Battery Scale Scores

	Summer School Group		Comparison Group		Difference
	N	Average	N	Average	
Found	171	682	144	684	2
Not Found	82	660	62	675	15

Table 2

BEP Summer School Follow-Up
Sample Demographics
Grade 3

	Total Study Group*		Statewide (1986)	
	N	Percent	N	Percent
Sex				
Male	248	57.4	2071	62.0
Female	184	42.6	1271	38.0
Ethnicity				
Black	260	60.2	1796	53.9
White	132	30.6	1387	41.6
Other	40	9.3	149	4.5

	Summer School Group		Comparison Group	
	N	Percent	N	Percent
Special Education Services				
None	176	81.5	171	79.2
Health Impaired	1	0.5	0	-
Learning Disabled	34	15.7	37	17.1
Mentally Handicapped	3	1.4	4	1.9
Hearing Impaired	0	-	1	0.5
Emotionally Handicapped	2	0.9	3	1.4
Chapter 1 (Average number of subjects)	203	0.34	202	0.30

* Students were matched on sex and ethnicity, (as well as CAT Scores), so that the two study groups (Summer School and Comparison) have exactly the same proportions.

Note: Comparisons between groups were made for the year the subjects were matched (1984-85 for the Comparison group, 1985-86 for the Summer School group).

Table 3

BEP Summer School Follow-Up
Sample Demographics
Grade 6

	Total Study Group*		Statewide (1986)	
	N	Percent	N	Percent
Sex				
Male	270	70.7	3174	68.1
Female	112	29.3	1490	31.9
Ethnicity				
Black	194	50.8	2177	47.1
White	172	45.0	2223	48.1
Other	16	4.2	220	4.8

	Summer School Group		Comparison Group	
	N	Percent	N	Percent
Special Education Services				
None	128	67.0	145	75.9
Health Impaired	1	.5	3	1.6
Learning Disabled	52	27.2	32	16.8
Mentally Handicapped	5	2.6	8	4.2
Hearing Impaired	1	0.5	0	-
Emotionally Handicapped	4	2.1	3	1.6
Chapter 1 (Average number of subjects)	182	0.57	172	0.44

* Students were matched on sex and ethnicity, (as well as CAT Scores), so that the two study groups (Summer School and Comparison) have exactly the same proportions.

Note: Comparisons between groups were made for the year the subjects were matched (1984-85 for the Comparison group, 1985-86 for the Summer School group).

1986 statewide BEP Summer School population, and the comparability of the Summer School and Comparison groups on potentially mediating third variables. As can be seen by looking at Table 2, sex and ethnicity breakdowns for the third grade study groups at the sample matching point and the statewide 1986 Summer School were similar. The study groups can be considered to be representative of the state, although the study groups had somewhat fewer males and more blacks than did the total Summer School population. Table 2 also shows the proportions of students in the Summer School and Comparison groups who received special education and/or Chapter 1 services. The proportions of students receiving these services in the two groups were quite similar.

As can be seen in Table 3, the sixth grade study groups at the Sample Matching Point were representative of the statewide Summer School population with respect to sex and ethnicity breakdowns. Proportionately the study groups had slightly more males and blacks. Comparing the two study groups with respect to special education and Chapter 1 services, it can be seen that there were considerably more Learning Disabled students in the Summer School group. For this reason, for these preliminary analyses Learning Disabled students were excluded from both groups for the sixth grade t-tests on CAT scores, absenteeism, and teacher grades.

Subsequent Summer School attendance. Because of the the expansion of the Summer School Program to more grades over time, it is not possible to compare Summer School attendance for the two groups. For example, at the third grade level Summer School was not available to the Comparison group at either the Sample Matching Point or Comparison Point 1, and only those who were retained could have attended at Comparison Point 2. For this reason Summer School attendance over the three year span is provided only for descriptive purposes

About 70 percent of third grade Summer School students attended only one summer session, 26 percent attended two, and about four percent attended three sessions. The percentage of Comparison group third graders who attended a session was less than two percent. For Grade 6, 48 percent of third grade Summer School students attended only one summer session, 50 percent attended two, and just over two percent attended three sessions. The percentage of

Comparison group third graders who attended a session was less than one percent.

Inferential statistics

Differences between Summer School and Comparison group means on *CAT* scores, absenteeism, and teacher grades in Mathematics, Language and Reading were statistically tested with t-tests ($p=.05$). In order to minimize the effect of missing data, students with data at the both the Sample Matching Point and Comparison Point 1 were compared at each of these points. Students with data at both Comparison Points 1 and 2 were then compared at these points. Independence of group (Summer School or Comparison) and the number of grade retentions for the three-year span were analyzed with Pearson's chi-square statistic.

Tables 4 and 5 summarize the results of the t-tests for Grades 3 and 6 respectively. An examination of Table 4 will show that for the Grade 3 study groups, at the Sample Matching Point Comparison students had significantly higher *CAT* scores. At Comparison Point 1 Summer School scores were higher, although only one of the two t-tests reached statistical significance. No difference was found at Comparison Point 2. For Grade 3 absenteeism, there was no significant difference between groups at the Sample Matching Point, and both t-tests showed significantly lower absenteeism for the Summer School group at Comparison Point 1. At Comparison Point 2 there was no difference.

The comparisons for Mathematics grades were significant for only one of the t-tests, at Comparison Point 1, and in favor of the Summer School group. The Comparison group had significantly higher Language grades at the Sample Matching Point, but not at any other point. No significant differences were found for Reading grades.

Sixth grade t-test results are provided in Table 5. *CAT* scores were very similar at the Sample Matching Point. Both t-tests at Comparison Point 1 showed a significant difference in favor of the Summer School group. At Comparison Point 2, the difference was in favor of the Comparison group. No significant differences were found for absenteeism.

For Mathematics grades, there was a significant difference in favor of the Comparison group at the Sample Matching Point, and then no difference at Comparison Point 1. At

Table 4

Means and t-test results for outcome variables*
Sample Match Pt. to Comparison Pt. 1 and Comparison Pt. 1 to Comparison Pt. 2[1]

Grade 3

Group	Number	Mean at Sample Matching Point	Mean at Comparison Point 1	Mean at Comparison Point 2
CAT Total Battery Scale Scores				
Comparison	175	622.9*	629.1*	
Summer School	156	610.6*	643.1*	
		(t=2.6, df=329)	(t=2.1, df=329)	
Comparison	159		634.1	675.2
Summer School	123		644.7	671.4
			(t=1.6, df=280)	(t=0.9, df=280)
Days Absent				
Comparison	188	8.1	8.5*	
Summer School	156	7.3	6.8*	
		(t=1.3, df=342)	(t=2.8, df=342)	
Comparison	177		8.1*	8.5
Summer School	132		6.8*	9.7
			(t=2.0, df=307)	(t=1.4, df=307)
Math Grades				
Comparison	167	2.1	1.8	
Summer School	108	2.0	2.0	
		(t=0.8, df=273)	(t=1.5, df=273)	
Comparison	162		1.8*	1.8
Summer School	115		2.0*	1.7
			(t=2.0, df=275)	(t=0.9, df=275)

* Means found to be statistically significantly different for the two groups are indicated with asterisks (*), $p < .05$.

[1] Comparisons were made for all regularly promoted students who had no more than one year of Summer School, who had data at the Sample Matching Point and Comparison Point 1, and then again who had data at both Comparison Points 1 and 2.

Table 4 (continued)

Means and t-test results for outcome variables*
Sample Match Pt. to Comparison Pt. 1 and Comparison Pt. 1 to Comparison Pt. 2[1]

Grade 3

Group	Number	Mean at Sample Matching Point	Mean at Comparison Point 1	Mean at Comparison Point 2
Language Grades				
Comparison	167	2.1*	1.8	
Summer School	116	1.9*	1.9	
		(t=2.0, df=281)	(t=1.3, df=281)	
Comparison	167		1.7	1.8
Summer School	113		1.9	1.7
			(t=1.2, df=278)	(t=0.7, df=278
Reading Grades				
Comparison	172	2.2	2.0	
Summer School	136	2.1	2.0	
		(t=0.6, df=306)	(t=0.2, df=306)	
Comparison	172		1.9	1.9
Summer School	127		2.0	1.7
			(t=0.9, df=297)	(t=1.3, df=297

* Means found to be statistically significantly different for the two groups are indicated with asterisks (*), $p < .05$.

1 Comparisons were made for all regularly promoted students who had no more than one year of Summer School, who had data at the Sample Matching Point and Comparison Point 1, and then again who had data at both Comparison Points 1 and 2.

Table 5

Means and t-test results for outcome variables*
Sample Match Pt. to Comparison Pt. 1 and Comparison Pt. 1 to Comparison Pt. 2[1]

Grade 6

Group	Number	Mean at Sample Matching Point	Mean at Comparison Point 1	Mean at Comparison Point 2
CAT Total Battery Scale Scores				
Comparison	73	689.9	683.3*	
Summer School	92	689.7	704.1*	
		(t=0.7, df=163)	(t=2.6, df=163)	
Comparison	86		686.0*	730.7*
Summer School	84		704.5*	717.2*
			(t=2.2, df=168)	(t=3.9, df=168)
Days Absent				
Comparison	99	7.2	8.4	
Summer School	92	7.8	8.9	
		(t=0.8, df=189)	(t=0.5, df=189)	
Comparison	101		8.3	9.2
Summer School	91		8.8	10.5
			(t=0.5, df=190)	(t=1.2, df=190)
Math Grades				
Comparison	89	1.9*	1.9	
Summer School	67	1.5*	1.8	
		(t=3.1, df=154)	(t=0.8, df=154)	
Comparison	88		1.8	1.8*
Summer School	72		1.6	1.3*
			(t=1.4, df=158)	(t=3.0, df=158)

* Means found to be statistically significantly different for the two groups are indicated with asterisks (*), $p < .05$.

1 Comparisons were made for all regularly promoted students who had no more than one year of Summer School, who had data at the Sample Matching Point and Comparison Point 1, and then again who had data at both Comparison Points 1 and 2. Specific Learning Disabled students were excluded from the Grade 6 sample.

Table 5 (continued)

Means and t-test results for outcome variables*
Sample Match Pt. to Comparison Pt. 1 and Comparison Pt. 2[1]

Grade 6

Group	Number	Mean at Sample Matching Point	Mean at Comparison Point 1	Mean at Comparison Point 2
Language Grades				
Comparison	91	2.1*	2.1*	
Summer School	73	1.7*	1.4*	
		(t=2.8, df=162)	(t=4.9, df=162)	
Comparison	87		2.1*	1.9*
Summer School	73		1.5*	1.3*
			(t=4.2, df=158)	(t=3.7, df=158
Reading Grades				
Comparison	89	2.1*	2.2*	
Summer School	73	1.9*	1.5*	
		(t=2.2, df=160)	(t=4.8, df=160)	
Comparison	84		2.2*	1.8*
Summer School	62		1.6*	1.4*
			(t=4.0, df=144)	(t=2.0, df=144

* Means found to be statistically significantly different for the two groups are indicated with asterisks (*), $p < .05$.

1 Comparisons were made for all regularly promoted students with no more than one year of Summer School, who had data at the Sample Matching Point and Comparison Point 1, and then who had data at both Comparison Points 1 and 2. Specific Learning Disabled Students were excluded from the Grade 6 sample.

Comparison Point 2, the difference was again in favor of the Comparison group. For both Language and Reading grades, every comparison was significant and in favor of the Comparison group.

Figure 2 illustrates the *CAT* results for both grades. For the third grade, although the gains that the Summer School group made at Comparison Point 1 were not sustained to Comparison Point 2, relative to the Comparison group it appears that they were performing at a relatively higher level than they were before Summer School. The sixth grade results clearly suggest a one year gain in performance for the Summer School group, with a drop in performance the following year.

Figure 3 illustrates absenteeism results for Grades 3 and 6. For Grade 3, absenteeism dropped for the Summer School group at Comparison Point 1, and then rose significantly for the following year. There was no effect for Grade 6.

Figures 4 through 6 illustrate results for teacher grades. As shown in Figure 4, teacher grades in Mathematics for the Grade 3 Summer School group may have risen significantly at Comparison Point 1, to drop again at Comparison Point 2. The Grade 6 results suggest that the initial superiority of the Comparison group may have disappeared at Comparison point 1, to reappear at Comparison Point 2. Results for teacher grades in Language and Reading essentially showed no effects.

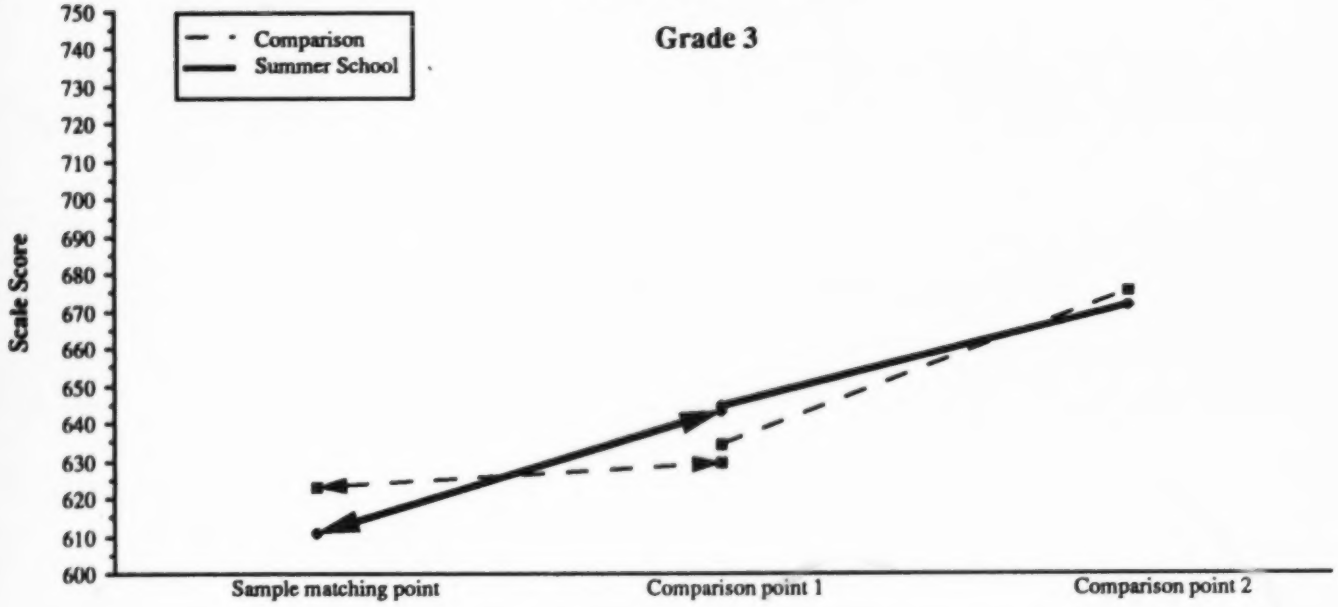
Table 6 provides chi-square results, including observed and expected frequencies, for the number of grade retentions after Grades 3 or 6. For Grade 3, group and retention were found to be independent. Significant chi-square results were found for Grade 6. A visual inspection of Table 6 suggests that the difference was that the Comparison group had more students with zero retentions than expected, and fewer students with one retention than expected. The opposite was true for Summer School students.

Summary and Discussion

The BEP initiated a promotion testing program and an associated BEP Summer School Program to remediate low-achieving students in the basic skill areas. This long-term follow-up of third- and sixth-grade graduates of the 1986 Summer School investigated whether the effects of the

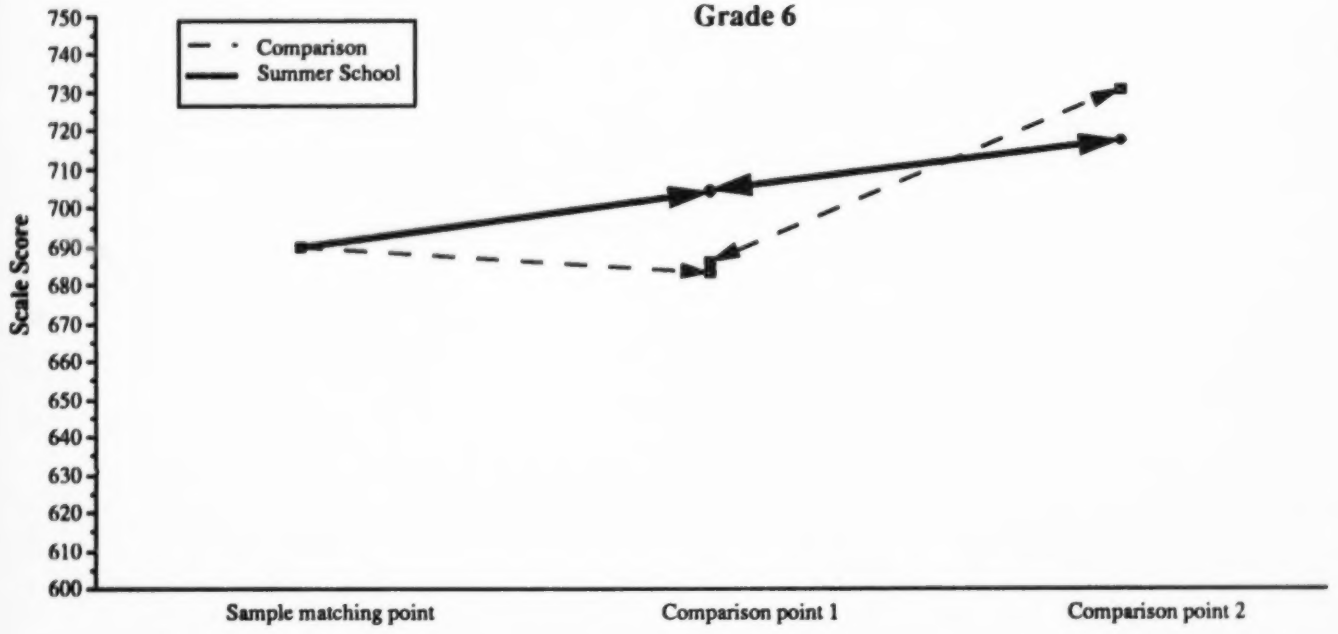
Figure 2
CAT Total Battery Scores*

Grade 3



Group	Number: Sample to Comparison 1	Number: Comparison 1 to Comparison 2
Comparison	175	159
Summer School	156	123

Grade 6



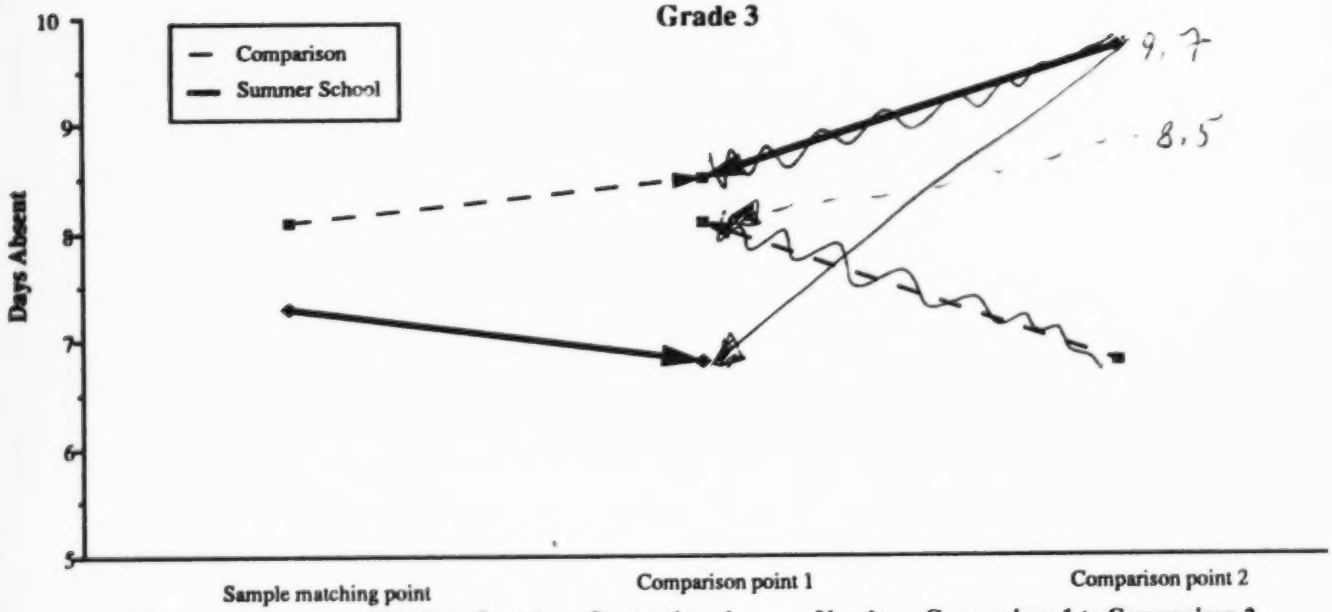
Group	Number: Sample to Comparison 1	Number: Comparison 1 to Comparison 2
Comparison	73	86
Summer School	92	84

Note: Arrows indicate significance at that point ($p<.05$).

*Results for students who were promoted for the two comparison years, and did not have more than 1 year of summer school. Sixth grade students who were classified as specific learning disabled were excluded from the sample.

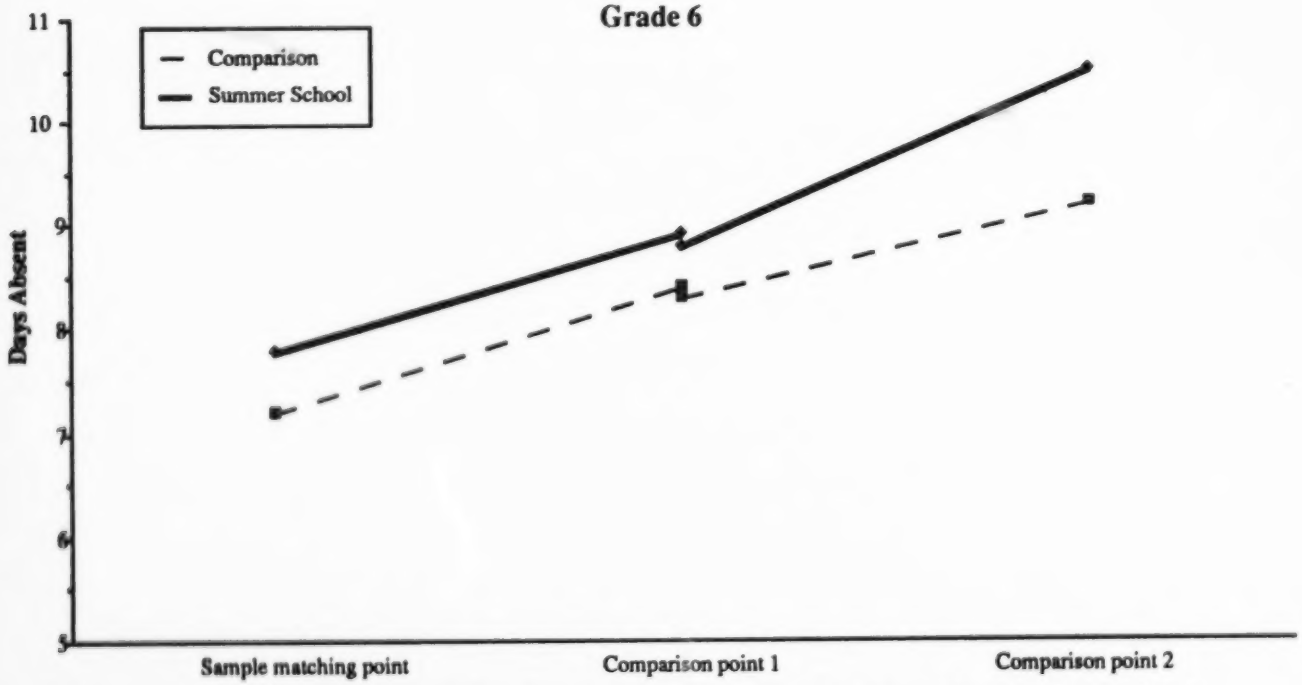
Figure 3
Number of Days Absent*

Grade 3



Group	Number: Sample to Comparison 1	Number: Comparison 1 to Comparison 2
Comparison	188	177
Summer School	156	132

Grade 6



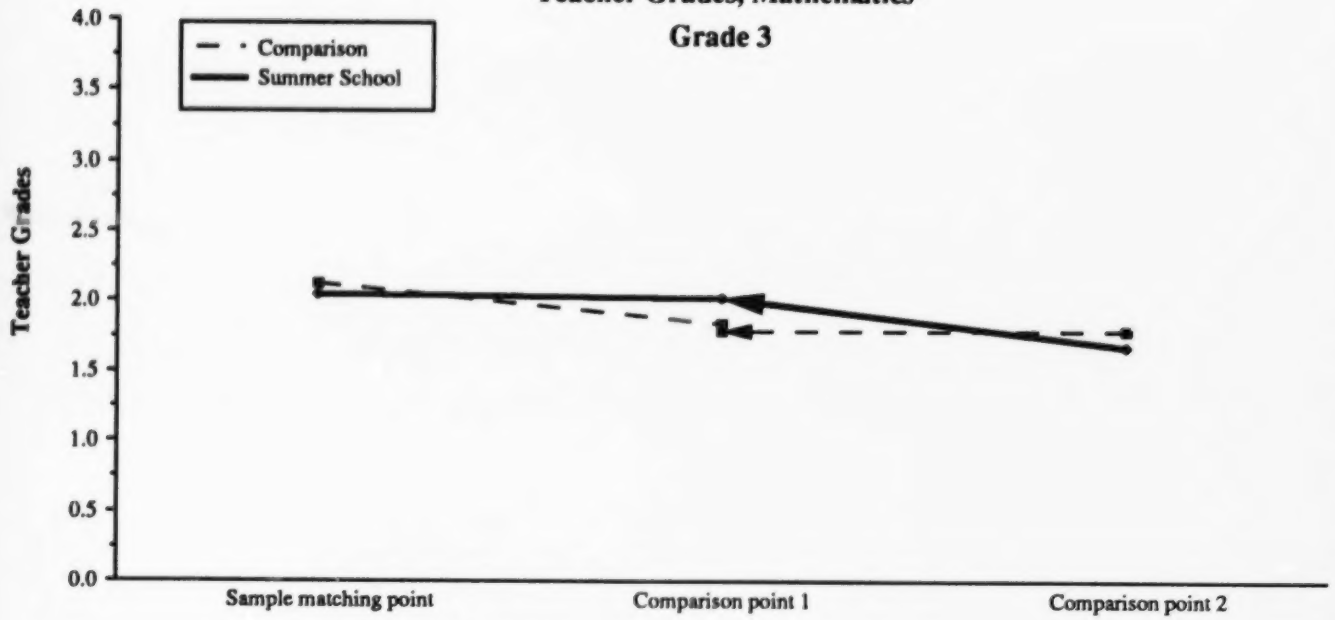
Group	Number: Sample to Comparison 1	Number: Comparison 1 to Comparison 2
Comparison	99	101
Summer School	92	91

Note: Arrows indicate significance at that point ($p<.05$).

*Results for students who were promoted for the two comparison years, and did not have more than 1 year of summer school. Sixth grade students who were classified as specific learning disabled were excluded from the sample.

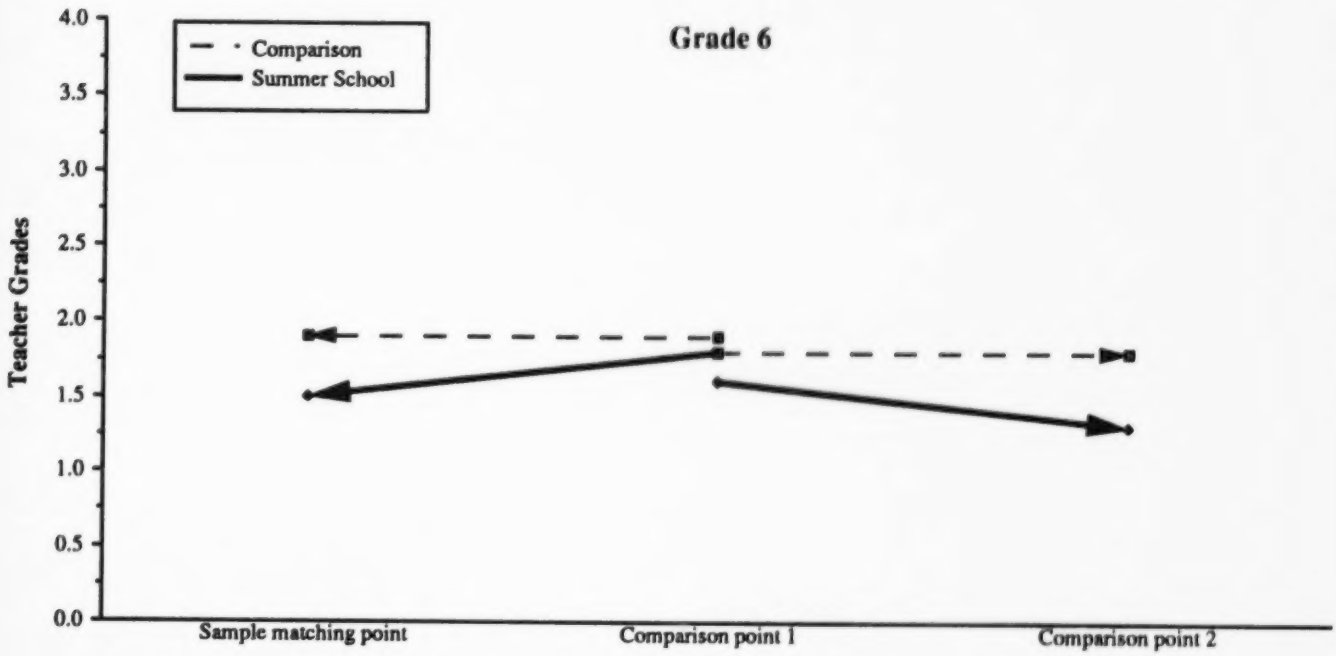
Figure 4
Teacher Grades, Mathematics*

Grade 3



Group	Number: Sample to Comparison 1	Number: Comparison 1 to Comparison 2
Comparison	167	162
Summer School	108	115

Grade 6

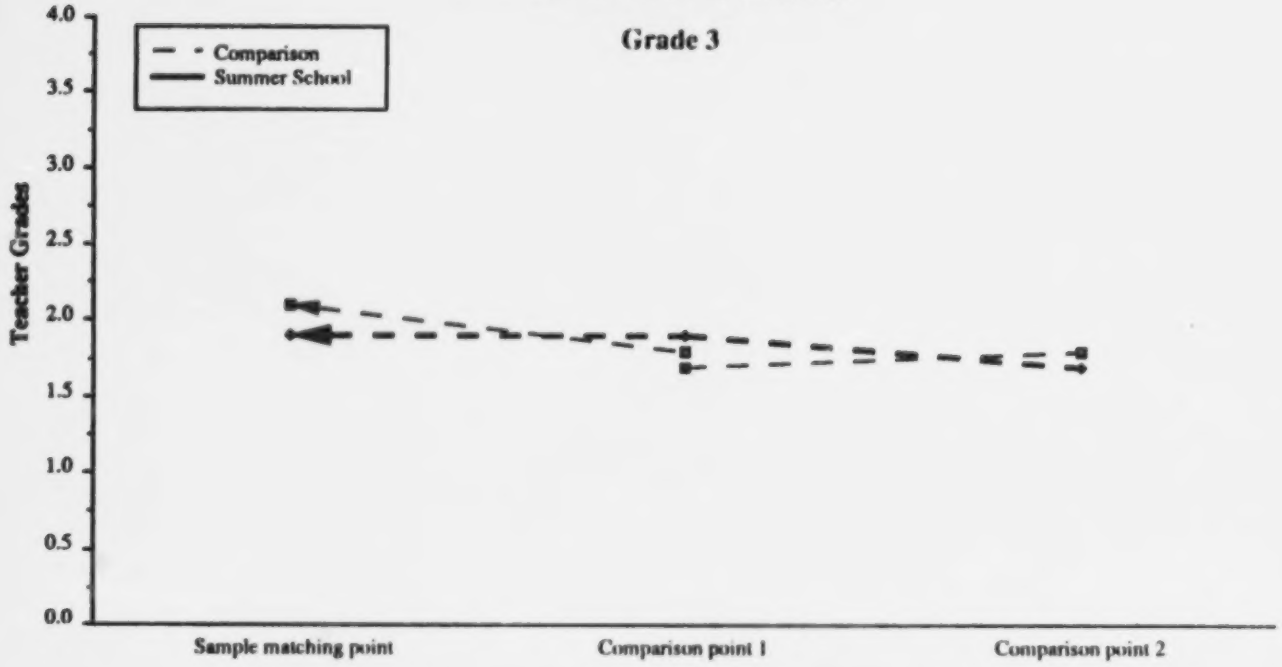


Group	Number: Sample to Comparison 1	Number: Comparison 1 to Comparison 2
Comparison	89	88
Summer School	67	72

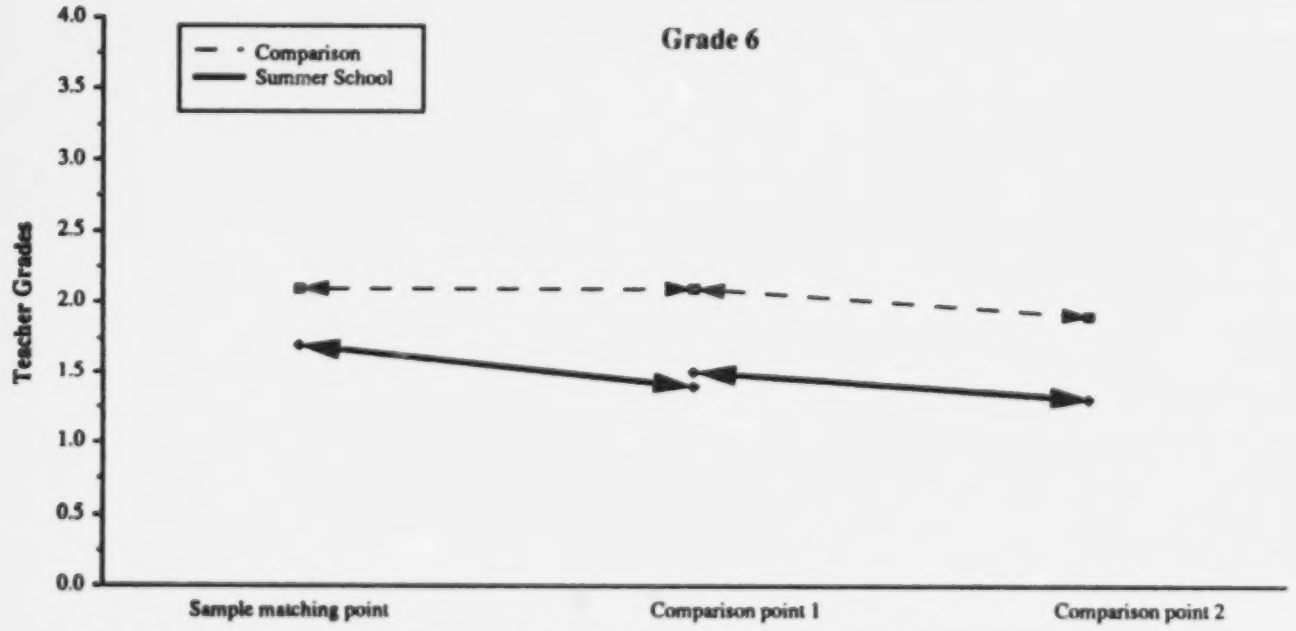
Note: Arrows indicate significance at that point ($p<.05$).

*Results for students who were promoted for the two comparison years, and did not have more than 1 year of summer school. Sixth grade students who were classified as specific learning disabled were excluded from the sample.

Figure 5
Teacher Grades, Language*



Group	Number: Sample to Comparison 1	Number: Comparison 1 to Comparison 2
Comparison	167	167
Summer School	116	113

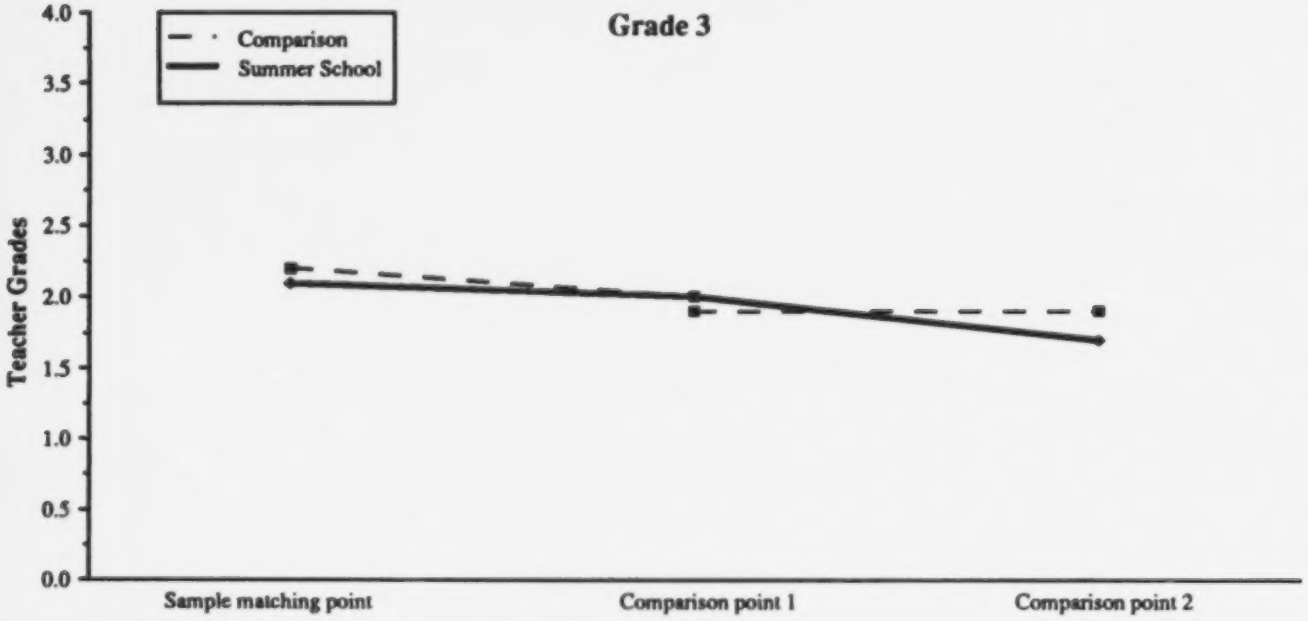


Group	Number: Sample to Comparison 1	Number: Comparison 1 to Comparison 2
Comparison	91	87
Summer School	73	73

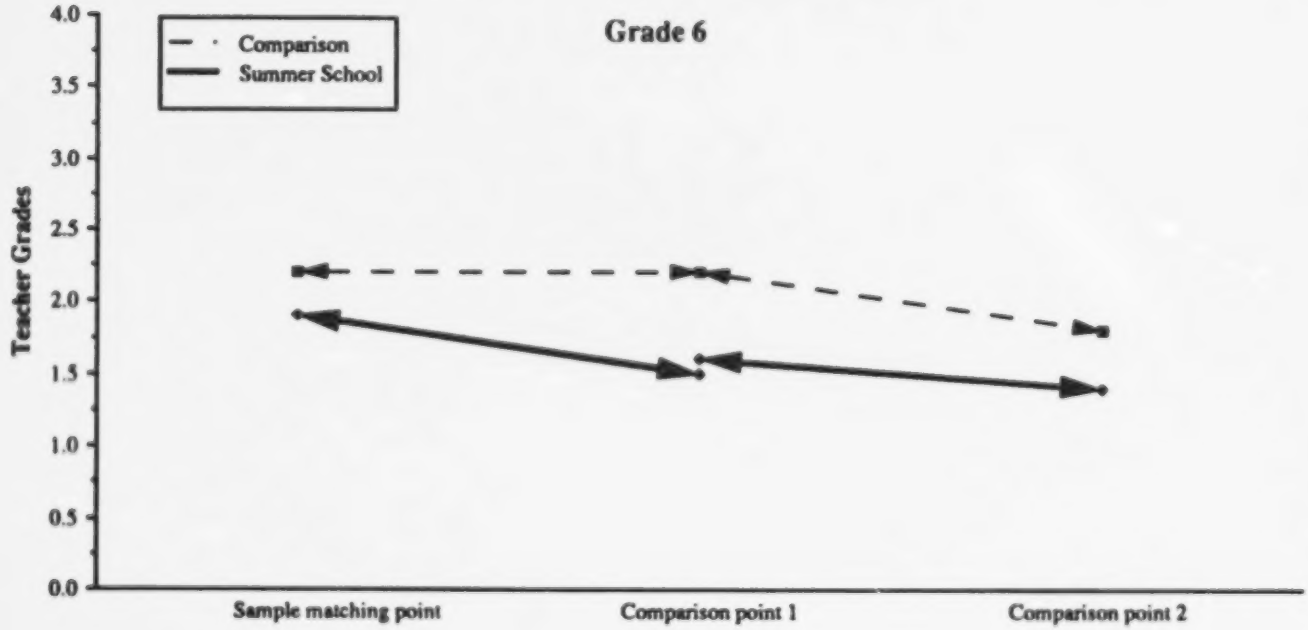
Note: Arrows indicate significance at that point ($p<.05$).

*Results for students who were promoted for the two comparison years, and did not have more than 1 year of summer school. Sixth grade students who were classified as specific learning disabled were excluded from the sample.

Figure 6
Teacher Grades, Reading*



Group	Number: Sample to Comparison 1	Number: Comparison 1 to Comparison 2
Comparison	172	172
Summer School	136	127



Group	Number: Sample to Comparison 1	Number: Comparison 1 to Comparison 2
Comparison	89	84
Summer School	73	62

Note: Arrows indicate significance at that point ($p<.05$).

*Results for students who were promoted for the two comparison years, and did not have more than 1 year of summer school. Sixth grade students who were classified as specific learning disabled were excluded from the sample.

Table 6

Chi-Square Results on Grade Retention
Observed (O) and Expected (E) Frequencies for Grades 3 and 6

Grade 3

Group	Retentions 0	Retentions 1	Number
Comparison	O=189 E=177.5	O=25 E=36.5	214
Summer School	O=166 E=177.5	O=48 E=36.5	214
Number	355	73	428

Chi-square=2.98, df=1, p> .05

Grade 6

Group	Retentions 0	Retentions 1	Retentions 2	Number
Comparison	O=157 E=148.5	O=14 E=23.5	O=2 E=1	173
Summer School	O=140 E=148.5	O=33 E=23.5	0=0 E=1	173
Number	297	47	2	346

Chi-square=10.66, df=2, p < .05

Summer School were sustained into the next two school years. Summer School students were compared to an earlier cohort of similar students who did not experience the remediation program. The students who were studied were representative of the state population of Summer School students, and overall, the Summer School and Comparison groups were similar at the point at which they were matched.

The current paper is only exploratory. The data base was complicated by grade retentions over the course of two years, varied summer school experience over two years, and by the problems of missing data that longitudinal studies all have. This paper has no analysis of the effect of sex or ethnicity, although these may very well be potent factors. The study of the effects of promotion versus retention is very difficult (e.g. see Jackson, 1975), but also extremely important.

There were some indications that the Comparison groups at both grades may have been performing somewhat better than the Summer School students at the Sample Matching Point. For the third grade sample, Comparison students had higher *CAT* scores, and higher teacher grades in Language. For the sixth grade sample, teacher grades are consistently higher in all three subjects. This may help to explain the "crossover" of *CAT* scores at Comparison Point 2 for Grade 6 Comparison students.

The graphic representations of *CAT* scores in Figure 2 illustrate that over time the scores were generally linear, with scores for the Summer School groups at both grades showing a "bump" for the year following Summer School. One result of the "lagged cohort" aspect of the study design was that, because of the switch to the re-normed version of the CAT in 1985-86, at Comparison Point 1 the Comparison cohort was taking the new test in the first year it was given, while the Summer School cohort was taking it the second time it was administered. Although this may appear to give an advantage to the Summer School group, since subsequent cohorts of students do generally perform better on standardized tests over the course of time, these increases for the statewide population at these grades were.quite small.

The results for *CAT* scores suggest that the Summer School program positively affected scores for one year, but that the gain was not maintained for two years. It is somewhat surprising

that a summer program of short duration had any effect on *CAT* scores. It is not surprising that it appears that the summer remediation would need to be repeated to continue to have an effect. Especially because these students are very much at the low end of the *CAT* score scale, it would have been interesting to have scores for the MSDT in order to see if increases in basic skills levels may have been sustained over two years.

The Grade 3 results for absenteeism were interesting. There was a clear decrease in absenteeism for Summer School students for the year following Summer School, and then a sharp increase the following year. Again, these results suggest that continued supplementary programs would be of benefit to high-risk students. It appears that the efforts of the Summer School teachers to positively impact the attitudes of these students toward school, and toward themselves as learners, may have been effective at the third grade, but that these positive attitude changes were fragile. The absence of an effect for Grade 6 students may demonstrate that attitudes of younger students are more malleable.

The results for teacher grades were less clear. It should be noted that, group differences aside, the grades for both groups were low (at the C or D level), and that they decreased over time. This is not surprising for these high-risk students. Essentially no differences in teacher grades were found at the third grade level, although judging from the *CAT* scores, one might have expected to see improved grades for the Summer School group at Comparison Point 1. These results suggest that teacher grades assess something other than performance was measured by the *CAT*. At the sixth grade level, Mathematics grades may have improved for the Summer School group at Comparison Point 1, but in general Comparison students had higher grades. Again, this is somewhat surprising when looking at the *CAT* results at Comparison Point 1.

The t-test results were only for students who were promoted at both the third or sixth grade level, and then again at either the fourth or seventh grade level. Additionally, the groups were limited to Summer School students who had only one year of Summer School, and Comparison students who had none. This limits the generalizability of the results.

The grade retention results were not expected, since one of the purposes of the Summer

School Program was to improve the performance of high-risk students and to decrease grade retention. In fact, statewide retention has been reduced since the inception of the summer program. Several factors may have affected the current results. First, the sample may have been biased by the attempt to include schools from school systems that had higher retention rates. Also, since the study followed the very first Summer School cohort, retention may have been affected by the legislative mandate for more rigorous standards for promotion.

Overall, the results of this study were extremely positive for the North Carolina BEP Summer School Program. Before the program was initiated, educators in NC pondered whether a program of limited duration could significantly improve the basic skills of low-achieving students, or affect their attitudes. Low-achieving students often demonstrate a cumulative deficit in academic achievement over time, i.e., these students fall increasing behind their peers as time goes by. It does appear that achievement as measured by standardized tests may be improved with summer remediation. This study provided indications that high-risk students can learn basic skills well in the summer school setting, and that the strengthened basic skills carry over to the next year, as measured by standardized achievement tests. However, it appears that the remediation may be best continued for more than one year.

Increases in basic skills knowledge have been linked to students' success later in life, for example to increased employment and decreased criminal activity. Thus the tax dollars that were spent on the BEP Summer School may be returned many times over, with decreased academic failure for high-risk students during the school years, and with their increased productivity as adults.

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